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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,077	02/09/2001	James L. Holloway	00-18	7482

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EXAMINER
SAOUD, CHRISTINE J

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 12/19/2002 //

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)
09/781,077	HOLLOWAY et al.
Examiner	**Art Unit**
Christine Saoud	1647

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Oct 15, 2002*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *31-36* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *31-36* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 8
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restriction

1. Applicant's election without traverse of Group I in Paper No. 6 is acknowledged. Applicant's election of the species "Glu-Glu" for the affinity tag is acknowledged (paper #10).

2. Claims 1-30 have been canceled and claims 31-36 have been added as requested in the amendment of paper #7, filed 18 June 2002. Claims 31-36 are pending and under examination in the instant application.

Sequence Compliance

3. The instant specification is objected to and is not in Sequence Compliance for the following deficiencies:

At page 6 of the specification, there are nucleic acid sequences which are represented by a Sequence identifier. It is not clear if these sequence are part of a larger sequence already present in the Sequence Listing, or if they are sequences which need to be added. Regardless, these sequences must have a Sequence identifier associated with them (see 37 CFR 1.821(d)). If these sequence require the addition of Sequence identifiers to the Sequence Listing, a new paper copy and computer copy of the Sequence Listing will be required as well as a statement that the paper and computer copies are the same and include no new matter. If these nucleic acid sequences are part of a larger sequence, reference should be made to the positions and the corresponding

Sequence identifier (such as nucleotides 20-30 of SEQ ID NO:100, for example), and a new Sequence Listing would not be required. Correction is required in response to this Office action.

The amino acid sequence at page 10, line 21 (Arg-X-X-Arg) and page 38, line 25 is also encompassed by the Rules regarding nucleotide and/or amino acid sequence disclosures in Patent applications (See MPEP 2422 and 37 CFR 1.821(a)), and therefore, also requires a Sequence identifier. Correction is required in response to this Office action.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 31-36 are rejected under 35 U.S.C. 101 because the claimed invention is drawn to an invention with no apparent or disclosed specific and substantial credible utility. The instant application has provided a description of an isolated DNA encoding a protein and the protein encoded thereby. The instant application does not disclose the biological role of this protein/DNA or its significance.

It is clear from the instant specification that the "insulin homolog polypeptide Zins4" described therein is what is termed an "orphan protein" in the art. This is a protein whose cDNA has been isolated because of its similarity to known proteins; in the instant case, similarity to

relaxin and insulin. There is little doubt that, after complete characterization, this protein may be found to have a specific, substantial and credible utility. This further characterization, however, is part of the act of invention and until it has been undertaken, Applicant's claimed invention is incomplete. The instant situation is directly analogous to that which was addressed in *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sus. Ct, 1966), in which a novel compound which was structurally analogous to other compounds which were known to possess anti-cancer activity was alleged to be potentially useful as an anti-tumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. §101, which requires that an invention must have either an immediately obvious or fully disclosed "real world" utility. The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility", "[u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form-there is insufficient justification for permitting an applicant to engross what may prove to be a broad field", and "a patent is not a hunting license", "[i]t is not a reward for the search, but compensation for its successful conclusion."

The instant claims are drawn to a protein (and compositions thereof) of as yet undetermined function or biological significance. It is clear, based on amino acid sequence similarity, that the protein of the claimed invention is evolutionarily related to insulin and relaxin, and therefore a new member of the insulin/relaxin family. However, this family of proteins is divergent in function and therefore, there is no well-established utility for the family members based on amino

acid sequence identity alone. The biological activities of insulin are very different from those of relaxin (see Straus, Endocrine Rev. 5(2): 356-369, 1984 and Bryant-Greenwood et al., Endocrine Rev. 15(1): 5-26, 1994), although the proteins are clearly of similar structure (see Bryant-Greenwood, Endocrine Rev. 3(1): 62-90, 1982). A sequence comparison of the claimed protein reveals approximately 50% amino acid identity to both insulin and relaxin family members (percentages differ depending on the protein of the family). Therefore, there is as much structural similarity to insulin as there is to relaxin, and one of ordinary skill in the art would not know if the biological activities of relaxin or insulin will be possessed, or if the protein will have its own distinct biological activity. The instant specification asserts that the claimed polypeptide may be used for pregnancy support (page 42 of the specification, for enhancing fertilization during assisted reproduction (page 42), for treating reproductive disorders (page 43), for treatment of disorders associated with gonadal development, pregnancy, pubertal changes, menopause, ovarian cancer, fertility, ovarian function, polycystic ovarian syndrome and other reproductive functions, modulation/treatment/prevention of pathological conditions in ovary, as well as suppression or control of ovulation for birth control (page 43, paragraph 2-3). The specification further asserts use of the claimed invention for diagnostic methods to analyze reproductive function or evaluation of ovarian cancer (page 43, bottom). Additionally, the specification asserts that the claimed polypeptide may modulate contractility in certain tissues and may be use for treatment of cardiovascular disease, infertility, *in vitro* fertilization, birth control, treating impotence or other male reproductive dysfunction, as well as inducing birth (see page 44, paragraph 1).

There is absolutely no evidence of record or any line of reasoning that would support the asserted uses or biological activities asserted in the instant specification. Furthermore, there is absolutely no evidence of record or any line of reasoning that would support a conclusion that the claimed polypeptide and compositions can be used in any method of treatment as implied in the specification, because it is not known what conditions/disorders/diseases would be responsive to the claimed invention, if any, because no biological activity has been disclosed for the claimed invention. Until some actual and specific significance can be attributed to the claimed protein of SEQ ID NO:2, the instant invention is incomplete. The disclosure that the claimed invention shares sequence similarity with relaxin and insulin is not a disclosure of how to use the claimed invention because the proteins which the claimed invention is related to have distinct biological activities and could not be used in the same manner. Furthermore, the biological activity or significance of the claimed invention cannot be predicted based on amino acid sequence information alone because the class of compounds to which the instant invention is related has divergent biological activities. In the absence of a knowledge of the biological activity or significance of the claimed invention, there is no immediately obvious patentable use for it. To employ the polypeptide of the instant invention in any of the disclosed methods would clearly be using it as the object of further research which has been determined by the courts to be a utility which, alone, does not support patentability. Since the instant specification does not disclose a credible "real world" use for claimed polypeptide and compositions thereof, then the claimed invention is incomplete and, therefore, does not meet the requirements of 35 U.S.C. §101 as being useful.

6. Claims 31-36 are rejected under 35 U.S.C. §112, first paragraph, as failing to adequately teach how to use the instant invention for those reasons given above with regard to the rejection of these claims under 35 U.S.C. §101.

Conclusion

7. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Christine J. Saoud, Ph.D., whose telephone number is (703) 305-7519. The Examiner can normally be reached on Monday to Thursday from 8AM to 2PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Gary Kunz, can be reached on (703) 308-4623.

Certain papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1 (CM1). The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. §§ 1.6(d) and 1.8). NOTE: If Applicant *does* submit a paper by fax, the original signed copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers.

Official papers filed by fax should be directed to (703) 872-9306. If this number is out of service, please call the Group receptionist for an alternate number. Official papers filed After Final rejection filed by fax should be directed to (703) 872-9307.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

CHRISTINE J. SAOUD
PRIMARY EXAMINER

Christine J. Saoud